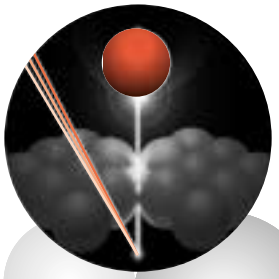


Data Transfer and Virtual Lab

We have several capabilities that augment our collaboration with clients, especially off-site subcontractors. Our goal is to increase the efficiency and productivity of the entire process of measurements and characterization. We do this through data transfer and virtual lab capabilities. And it's easy for you, while your proprietary information remains confidential. Just contact an NREL researcher to set up secure access. For more information, see our Web site at www.measure.nrel.gov.

NREL can send data over the Internet in real time — such as this topographical image of CdTe material.

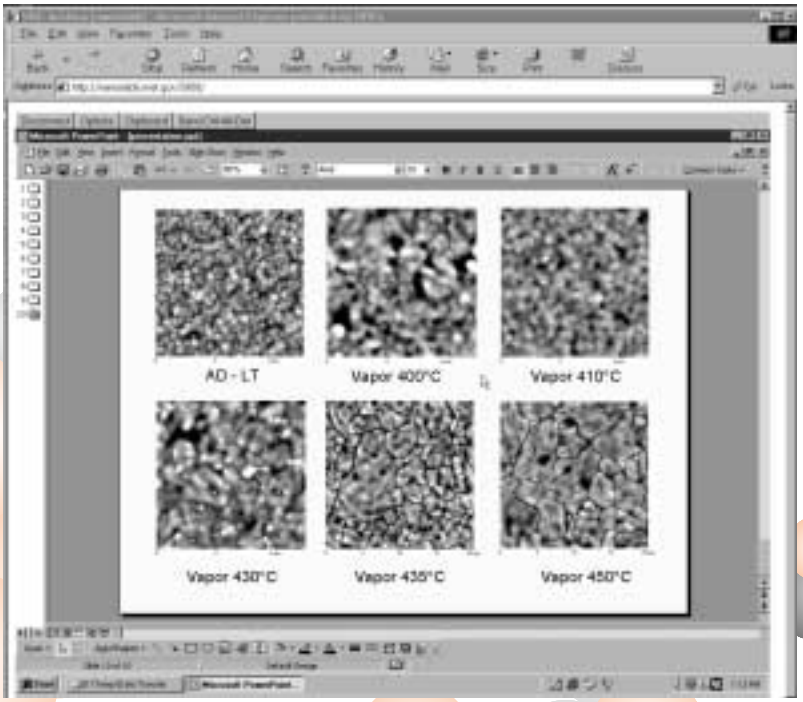
Data Transfer

We have a server that facilitates the efficient transfer of data between the Measurements and Characterization Division and our clients. The server can be accessed through either a Web-based browser or an FTP client; in both cases, the data are secure through password-protection. This service allows the rapid transfer of even large sets of data without concern for limits on the size of e-mail attachments or e-mail accounts.

Virtual Lab Capabilities

Virtual lab capabilities enhance the client/researcher interaction by deploying data and analysis in real time. This capability fosters the same increased productivity that many clients gain when they are able to sit beside an NREL researcher and discuss the ongoing measurements as they occur. Currently, we have two capabilities that create this collaborative environment for those who are not located near NREL. Access is achieved through a Web browser, and all data transfers are securely password-protected.

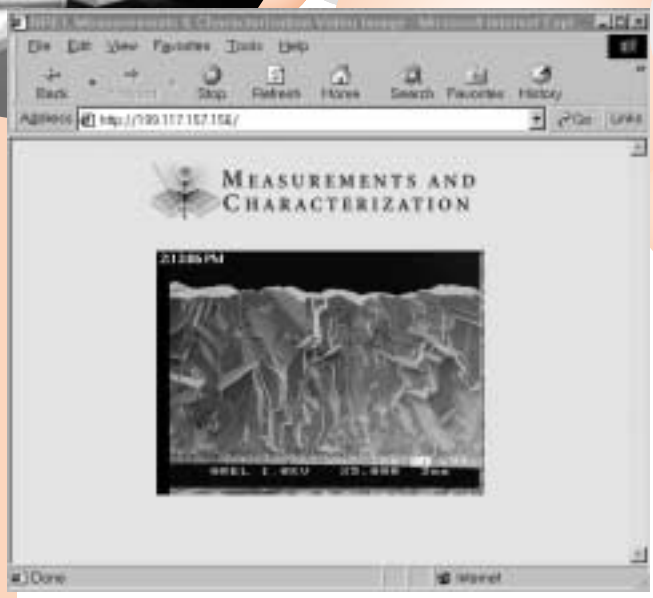
Real-Time Access of Desktop Images — allows an off-site client to observe a computer desktop image, while talking to an NREL researcher over the phone line. In a typical application, NREL researchers compose graphs or data of interest on their computer screen and then allow the off-site client access to this image. This capability is very useful in discussing current results and quickly determining a future course of action.



Researchers at different locations can both be referring to the same images and data in real time. This example shows a PowerPoint presentation of various images from NREL's atomic force microscope.

While this NREL scientist adjusts the scanning electron microscope, he can discuss the resultant micrograph with others via an image transmitted to a Web browser. (Jim Yost Photography/ PIX02022.)

Real-Time Access of Video Images — allows an off-site client to observe a video image of an ongoing analysis in real time, while talking to an NREL researcher over the phone line. One application particularly suited to this capability is real-time access to the scanning electron microscope (SEM) video image. This live interaction allows a client to effectively control the initial survey and personally select the SEM images of interest.



National Renewable Energy Laboratory
1617 Cole Blvd., Golden, CO 80401

NREL is a national laboratory of the U.S. Department of Energy, operated by Midwest Research Institute, the Battelle Memorial Institute, and Bechtel

Measurements and Characterization is a division of the National Center for Photovoltaics at NREL
Web site: www.nrel.gov/measurements
Phone: (303) 384-6675
Fax: (303) 384-6604

BR-520-27778 • March 2000